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PROJECT
1526892

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VOLUME I OF III

PLANNING DOCUMENTS
PHASE 2 REMEDIAL INVESTIGATION
ADDENDUM No. 1
WORK PLAN AND SAMPLING PLAN
FINAL

REMEDIAL INVESTIGATION/
FEASIBILITY STUDY

BELOIT CORPORATION
ROCKTON FACILITY
ROCKTON, ILLINOIS

MAY 1994

PREPARED FOR:
BELOIT CORPORATION
ROCKTON, ILLINOIS

• • •
PREPARED BY:
WARZYN INC.
MADISON, WISCONSIN





May 13, 1994

Mr. Eric Runkel, Environmental Protection Specialist
Illinois Environmental Protection Agency
Bureau of Land
2200 Churchill Road
P.O. Box 19276
Springfield, Illinois 62794-9276

Re: Phase 2 Planning Documents - Final
Beloit Corporation Rockton Facility NPL Site

Dear Mr. Runkel:

On behalf of Beloit Corporation, Warzyn is submitting two copies of the Final Phase 2 Work Plan Addendum, Quality Assurance Project Plan (QAPP) and Health and Safety Plan. The Phase 2 Work Plan Addendum is the culmination of several meetings between the Illinois Environmental Protection Agency (IEPA) Ecology & Environment Inc. (E & E) and Beloit Corporation/Warzyn Inc. This final version of the Work Plan responds to IEPA written comments and the discussions at the aforementioned meetings. We anticipate your approval of these planning documents and continuation of this next phase of work at the site.

We have scheduled with Beloit Corporation and our subcontractors for the field work to begin June 1, 1994. If you have any questions please call.

Sincerely,

WARZYN INC.

Kevin J. Domack
Project Manager

Enclosures: Phase 2 Work Plan Addendum - Final (2)
Quality Assurance Project Plan (QAPP) (2)
Health and Safety Plan (2)

cc: Mr. Michael Radcliffe - Harnischfeger Industries Inc. (1)
Mr. Dennis Hays, Beloit Corporation (1)
Mr. Matthew Dunn, Illinois Attorney General's Office (1)
Mr. Frederick Mueller, Johnson & Bell (1)
Mr. Richard Coghlan, Ecology & Environment (2)
Mr. Paul Jagiello, IEPA (1)
Mr. Charles Brasher, U.S. EPA (1)
Mr. Russ Hebb, Beloit Corporation (6)

THE PERFECT BALANCE
BETWEEN TECHNOLOGY
AND CREATIVITY

KJD/ndj/JDB
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PROJECT
1526892


VOLUME I OF III

PLANNING DOCUMENTS
PHASE 2 REMEDIAL INVESTIGATION
ADDENDUM No. 1
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FINAL

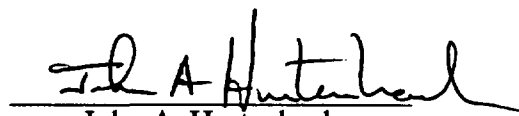
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FEASIBILITY STUDY

BELOIT CORPORATION
ROCKTON FACILITY
ROCKTON, ILLINOIS

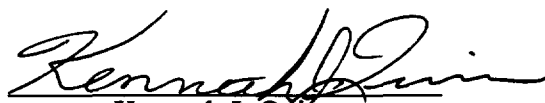
MAY 1994



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INTRODUCTION

This addendum to the Beloit Corporation Blackhawk Facility (site) Remedial Investigation and Feasibility Study (RI/FS) Work Plan discusses modifications and additions to the original planning documents. These modifications and additions describe the activities proposed for the Phase 2 RI activities at the site.

The principle objective of Phase 2 activities is to identify and characterize potential points of release, to the extent practicable. Further assessment of contaminant migration for the site will be completed in a subsequent phase. Information on contaminant migration close to the BCP and presumed source areas will be used to effectively design any remaining work for Phase 3, including risk and ecological assessment issues.

1.1 BACKGROUND

The Phase 1 RI was completed and the results presented in Technical Memorandum No. 1 (Warzyn, July 1993). An outline of proposed Phase 2 data collection activities was presented to the Illinois Environmental Protection Agency (IEPA) in a letter dated June 22, 1993. Meetings were held between representatives of the Beloit Corporation, Warzyn Inc. (Warzyn), IEPA, and Ecology and Environment (E&E) on August 12, 1993, September 16, 1993, September 24, 1993 and again on October 6, 1993 to discuss the proposed Phase 2 activities. Written comments from the IEPA were received on November 17, 1993. A subsequent meeting was held on January 13, 1994 between Beloit Corporation, Warzyn, IEPA, E&E and a third party technical expert on groundwater contamination who provided review and analysis of the Phase 2 Work Plan Addendum. During these meetings IEPA's concerns regarding the proposed Phase 2 activities were discussed with IEPA. This Addendum includes the modifications agreed on between IEPA/E&E and Beloit Corporation/Warzyn.

The primary objective of Phase 2 is to identify (a) point(s) of release that appear to be beneath the Beloit Corporation Plant, based on the results of Phase 1. The Phase 2 investigation is not intended to fully characterize contaminant migration nor address all issues that may be associated with the Baseline Risk Assessment. These issues will be evaluated on the basis of Phase 1 and Phase 2 results, and will be part of Phase 3 investigation activities, as necessary.

Residential well sampling and analysis will be performed in the Blackhawk Acres Subdivision. This activity will be performed by the State of Illinois Department of Health or as designated by the IEPA. This activity will be performed outside of the Work Plan although the data will be presented in the RI Report.

The Phase 2 data collection activities are to be performed as part of Task 2, Site Investigation, as presented in the Work Plan (Vol. 1, Planning Documents) for the Beloit Corporation Blackhawk Facility, dated June 1992. The Phase 2 work will be conducted in accordance with this Work Plan Addendum which refers to the IEPA approved planning documents previously prepared for this RI/FS, where appropriate.

1.2 WORK SCOPE

The RI is proceeding in a phased approach, accordance with U.S. EPA Guidance. Phase 1 identified four potential points of release; in the vicinity of the Beloit Corporation Plant (BCP); the storage yard area (SYA) of the Beloit Corporation property; the foundry sand disposal area (FSDA); and the Fiber Sludge Spreading Area (FSSA). The primary objective of the Phase 2 work scope is to identify and characterize, to the extent practicable, possible points of release within the BCP and the SYA. In addition, sampling in the FSDA will be performed to further characterize the extent of contamination in this area. A monitoring well will be installed immediately downgradient of the FSDA to assess possible impacts to groundwater. Also, surficial contamination will be evaluated in the FSSA, FSDA and SYA.

Phase 2 activities are based on data presented in Technical Memorandum 1 and will be revised based on field analyses, as described below. In addition, water levels have been collected on a regular basis. An average water table map is presented as Drawing F15 in this Work Plan. This is based on water table maps presented in Tech Memo 1 and water levels from November 12, 1992, March 9, 1993, May 26, 1993, and August 12, 1993. The average water table map was developed by preparing a water table map for each date and using an automated contouring package (Quicksurf). Each surface was then added together and the result divided by the number of surfaces. This map, along with additional rounds of water levels, will be used in helping to select investigation locations,

as described in Section 2.

The Phase 2 site investigation will address the following areas, and include the following activities:

1.2.1 Source Characterization

Phase 2 investigation activities will be performed in the four potential point of release areas identified during Phase 1.

1.2.1.1 Beloit Corporation Plant Building (BCP) - Investigative activities conducted in the BCP are intended to identify and characterize potential points of release within or adjacent to the building. These areas are based on an assessment of areas in the BCP where materials of concern might have been used, stored or disposed. The contaminants of concern, chlorinated solvents, were used by Beloit in limited quantities for a 3 to 4 year time period. Work will include sequential activities of soil gas survey, soil borings, geotechnical boring, deep groundwater quality borings, and the installation and sampling of wells, with each step drawing on the findings of the previous step.

1.2.1.2 Storage Yard Area (SYA) - Activities conducted in the SYA are intended to further characterize the nature and extent of volatile organic compounds (VOC) detected in this area during the Phase 1 soil gas activities. Work will include additional soil gas sampling, soil borings with soil sampling, a deep groundwater quality boring, and collection of surface soil samples.

1.2.1.3 Foundry Sand Disposal Area (FSDA) - Investigative activities conducted in the FSDA are intended to better define the horizontal and vertical limits of apparent contamination in this area. Work includes collecting surface soil samples and drilling and sampling soil borings.

Investigation activities in the FSDA will also include installation of one water table monitoring well downgradient of the FSDA in the location shown on Drawing F12.

1.2.1.4 Fiber Sludge Spreading Area (FSSA) - Investigative activities conducted in the FSSA are intended to further characterize the nature and extent of potential surface contamination in this area. Work includes collecting surface soil samples for risk assessment purposes and replacing one downgradient water table monitoring well (well W4 replaced as W26).

1.2.1.5 Beloit Corporation East Side of Plant

The two groundwater quality boring (W32C and W34C) locations have been relocated adjacent to the eastern side of the BCP to be included as part of source characterization (see Drawings F12 and F13). These two borings will be drilled

last and located based upon data obtained during the soil gas and soil boring portions of the investigation.

1.2.1.6 Well Abandonment/Well Replacement - The intent of this activity is to replace wells which have been found to be dry.

1.2.1.7 Evaluate Influence of Beloit Corporation Production Wells - This activity will evaluate the influence of the Beloit Corporation Production wells on the local shallow groundwater flow. This assessment can provide significant information on the potential for hydrostratigraphic connection between the upper and lower aquifer. Activities to be conducted under this task include recording pumping and flow rate in one production well, and recording water levels in a number of monitoring wells over time. This task will be carried out at the conclusion of Phase 2 activities and only if feasible and appropriate.

1.2.2 Soil and Groundwater Contamination Assessment

Phase 2 monitoring well sampling and analysis will be performed to confirm the field screening analysis and to determine changes in VOC concentrations at existing wells. Surface soil samples will be collected on the site for use in the Baseline Risk Assessment.

1.2.2.1 Round 2 Groundwater Sampling - The intent of the Round 2 groundwater sampling is to obtain Data Quality Objective Level IV (DQO - Level IV) data from new wells, determine changes in VOC concentrations and to confirm Round 1 results, where necessary. This task includes the collection and laboratory analysis of groundwater monitoring well samples.

1.2.2.2 Background Surface Soil Sampling - The intent of this activity is to collect background surface soil data for use in the Baseline Risk Assessment. Work conducted under this task will include the collection and laboratory analysis of five background surface soil samples. Locations are proposed and shown on Drawing F12.

1.2.2.3 Private Well Sampling - The collection and analysis of private well samples will be conducted by the Illinois State Department of Health or IEPA's designate, outside of this Work Plan. The results of this activity will be presented in the RI Report.

1.3 ADDENDUM FORMAT

Revisions to the original planning documents are presented in sections 2 through 5. These sections are as follows:

- Section 2 - Addendum to the Work Plan
- Section 3 - Addendum to the Field Sampling Plan
- Section 4 - Addendum to the Quality Assurance Project Plan

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ADDENDUM TO THE WORK PLAN

The text additions presented below are hereby incorporated into the Work Plan (Volume 1) of the planning documents for the Beloit Corporation Blackhawk Facility RI/FS.

2.1 SOURCE CHARACTERIZATION

Phase 2 investigation activities will be performed to further identify and characterize, to the extent practicable, the chemical and physical nature of potential source areas at the Site. Potential source areas suggested by the Phase 1 investigation include:

- Potential VOC source area or areas beneath or adjacent to the Beloit Corporation Plant (BCP) building
- Potential VOC source area or areas within the Storage Yard Area (SYA)
- Potential polycyclic aromatic hydrocarbon (PAH) source area within the Foundry Sand Disposal Area (FSDA) and the Fiber Sludge Spreading Area (FSSA)

The following subsections describe specific investigative activities to be conducted in the potential source areas listed above. Work will be conducted as sequenced studies and subsequent work will draw on the conclusions of the previous study with contingencies in all steps that depend on the field findings.

2.1.1 Soil Gas Survey

A soil gas survey will be conducted in and around the BCP building and in the SYA. The approximate location for each survey point in and adjacent to the BCP building is shown on Drawing F13. Approximate soil gas survey locations in the SYA are shown on Drawing F14.

Twenty seven soil gas survey locations are proposed inside the BCP (see Drawing F13). The spacing between soil gas samples ranges from 30 ft to 150 ft. The logic for each sample is described in Table 1. In general, these are located at current or former exits and potential outside storage or disposal areas. In addition, a line of soil gas samples will be collected down the middle of the expansion area to evaluate potential releases outside the original plant.

Although accounts from plant personnel suggest solvents were never used in the weldery, six soil gas samples will be collected through the floor of the weldery to evaluate the potential of contamination resulting from the weldery area within the BCP, at the request of IEPA.

The soil gas samples collected inside the BCP will be collected at a depth of 6 ft using a hydraulically driven probe (e.g., a Geoprobe™). This depth has been selected to collect soil gas samples that are characteristic of subsurface soils rather than the construction fill material beneath the concrete floor.

A total of 14 soil gas samples will be collected around the BCP southern perimeter and along the western perimeter of the BCP assembly area (Drawing F13). The soil gas survey proposed in the SYA consists of nine locations between the southern boundary of the SYA and the BCP building. Four soil gas locations are proposed between the SYA and FSSA (Drawing F14). Soil gas samples outside the BCP building will be collected at a depth of approximately 3 to 4 ft.

Soil gas samples will be analyzed in accordance with the protocol established and approved in the Phase 1 scope of work. Results of the soil gas survey will be tabulated in the field, for identification of a potential source area. If a soil gas anomaly is identified additional soil gas samples will be collected at locations radiating away from the anomaly in the direction of adjacent non-detect sample locations. An anomaly will be determined in the field by plotting results on a map. However, in the event that all but one sample is below detection, an anomaly would be considered a result equal to or greater than 5 ug/L (i.e., total target VOCs in excess of 5 ug/L, which is the detection limit, surrounded by non-detects). The significance of 5 ug/L is that in previous project experience, 5 ug/L, although relatively low, is above the MDL and generally indicates that contamination may be present. Therefore, the number of additional samples will be based on the magnitude and location of the anomaly within the survey grid. The soil gas investigation will continue until any identified anomalies have been adequately characterized by additional sampling.

The approved Field Sampling Plan (Appendix A of the QAPP) presents detailed information regarding the soil gas sampling procedures and equipment. Target compounds and QA objectives for the analyses are described with the methods description in the QAPP.

2.1.2 Soil Borings and Soil Sampling

The purpose of the soil borings proposed in this phase is to identify and characterize potential source areas. This will be done through analysis of soil samples from above the water table and a water quality sample at the water table. Soil borings will be performed in the BCP building (SB22, SB23, SB24, and SB30), along the southern perimeter of the BCP building (SB25), in the SYA (SB26 and SB27), and in the FSDA (SB28 and SB29). Tentative locations for the soil borings are shown on Drawing F12. Boring locations may be modified to evaluate soil gas anomalies.

Up to three additional soil borings may be conducted in the vicinity of each of the four initial borings (SB22, SB23, SB24, SB30) within the BCP, if the initial borings (along with soil gas information) indicate a significant source area. The existence of a significant source area will be determined in the field by identifying areas that have the capability of creating the contaminant distribution observed. This will be based on a comparison between the field GC results of the available soil gas, soil samples and groundwater samples, including other information such as groundwater flow directions. Locations will be selected with input from the IEPA or their representative. Sampling and analytical procedures for the additional borings would follow those of the four initial borings.

Space and access limitations within the BCP may require use of a drilling rig unable to operate with larger diameter augers to the required depth. At these locations, a 2 1/4 in. ID hollow stem augers (HSA) would be used. Soil samples will be collected using a 2-in. split spoon. Water table monitoring wells installed at locations utilizing the 2 1/4 in. ID HSA will be constructed of 1-in. ID well casing with a 10-ft stainless steel 0.010-in. slot well screen and PVC riser. The wells within the BCP will be completed as flush mounts.

Each shallow soil boring will be advanced into the water table (25 to 35 ft) using hollow stem augers. Soil samples will be collected at 2 ft intervals (i.e., continuous sampling using a 2-ft long split spoon on a 2-ft interval) using a 3-in. split spoon sampler. The 3-in. sampler is primarily needed for acquiring enough sample volume for the required laboratory analyses. However, in some instances, a 2-in. split spoon sampler may be necessary for soil composition evaluation. Field decisions will be required to determine which sampler is most appropriate for each boring. Soils collected with the split spoon sampler will be visually described by a geologist/engineer using the Unified Soil Classification System (USCS) (evidence of contamination will also be noted on the soil borehole log). Representative samples will be placed in labeled sample containers.

Samples for field GC analysis will be conducted on a minimum of a 5 ft interval. All samples will be screened using a PID and the field headspace method included in Appendix C4. If a sample not planned for field GC analysis has a higher PID

reading than the 5-ft interval sample, then the sample may be analyzed as an alternate, or additional, sample. In addition, samples will be collected for field GC analysis at changes in stratigraphy. The samples at changes in stratigraphy will focus on sand soil directly above a fine grained soil.

If during soil boring activities PID (>1,000 instrument units), visual or olfactory evidence suggests the potential for existence of a free phase NAPL, the boring will be discontinued and abandoned. This will be done so as not to create a vertical migration pathway for contaminants encountered during drilling. Identification of this vertical migration pathway is only of concern when there is sufficient NAPL to be in free phase (i.e., able to move through the soils as a liquid-not in residual phase). A PID reading of 1,000 instrument units would be effective at identifying free phase NAPL (based on discussions with Stan Feenstra). The presence of NAPL at lower concentrations (of importance to the RI/FS) will be based on the GC analyses and published criteria to be presented in reports when the data is presented and interpreted. Following abandonment, the boring will be moved to a nearby location that associated investigation data suggests is practicable, sampled as specified for the planned borings, and continued to the predetermined depth specified by the drilling program.

Field GC analysis will consist of the headspace method described in the revised Standard Operating Procedure (SOP) for Field Analysis of Volatile Organics (Appendix C2 of the QAPP). Soil samples will be selected for laboratory analysis of U.S. EPA CLP Target Compound List (TCL) organics and Target Analyte List (TAL) inorganics based on the following criteria:

- Field GC results
- Visual evidence of soil contamination
- Distinct soil stratigraphic changes (e.g., contact at aquifer/aquitard boundary)

A minimum of 11 soil samples will be submitted for laboratory analysis with at least one sample having been collected from each soil boring. For soil borings at the BCP and SYA, soil sample selection will be made in the field; field GC screening will be the primary basis for this selection. Samples not analyzed by the field GC will not be sent to the lab for analysis. If all field analyses from a particular boring are below detection, the sample from a depth of approximately 10 ft will be submitted for lab analysis. This depth is selected to be; deep enough that in situ volatilization would not substantially reduce the concentrations and, not deep enough to be separated from a possible point of release. For each boring in the FSDA (SB28, SB29) one soil sample from just above the water table and one from approximately 5 ft below the water table will be submitted for analyses. No

field GC screening will be performed for these borings due to the intervals for analysis being predetermined.

In addition to the soil samples, a groundwater sample will be collected from each soil boring location. The borings will be drilled with a screened lead auger which will allow groundwater to enter the auger from the water table. The groundwater sample will be collected immediately below the water table using a stainless steel bailer and cable. Groundwater samples will be analyzed for VOCs using the field GC.

A minimum of two soil borings in the BCP will be converted to water table wells to provide water level control points and groundwater will be sampled for laboratory analysis of the full parameter list at DQO Level IV. These locations will be selected to be within or adjacent to documented source areas based on results of the soil gas and soil boring results. If no source areas are identified, an appropriate spacing within the BCP will be selected (in areas outlined on Drawing F13).

One geotechnical soil boring will be conducted, on the north side of the BCP, to the top of the clay layer to provide additional information on soil stratigraphy in the vicinity of the BCP. The boring will be sampled on a 5-ft interval, to the clay and a Shelby Tube sample of the clay will be collected, if possible, for laboratory determination of hydraulic conductivity.

Each soil boring, not converted to a well, will be abandoned using the method described in Section 5.2.3 of the FSP. Boring locations will be marked to be surveyed for location and ground surface elevation.

2.1.3 Surface Soil Sampling

Phase 2 surface soil samples will be collected to provide additional data for the baseline risk assessment. A total of thirteen surface soils samples will be collected, including: three from the SYA (SB26, SB27 and SS01) five from the FSDA (SS02 through SS06), and five from the FSSA (SS07 through SS11). The samples in the SYA will be collected at locations of identified soil gas anomalies (i.e., SB26 at SG130, and SB27 at SG107). Sample SS01 will be collected within the SYA at a third location, if another soil gas survey anomaly is identified. Surface soil sampling locations are shown in Drawing F12. Note that additional background surface soil sampling will also be conducted during Phase 2, as described under Section 2.3.2.

Section 3 of this addendum and the original Field Sampling Plan presents detailed information regarding surface soil sampling procedures and equipment. The surface soil samples will be analyzed for the parameters listed in Table 2. Target compounds and QA objectives for the analyses are described in Section 4 of this

addendum and the original QAPP.

2.1.4 Deep Groundwater Quality Borings

The purpose of these proposed deep groundwater quality borings is to investigate the potential for a dense non-aqueous phase liquid (DNAPL) below the water table; determine the vertical distribution of groundwater contamination beneath the site; evaluate potential migration pathways close to the source areas ; and to determine whether there may be additional VOC source areas present not yet identified. Deep groundwater quality borings will be performed at the following locations (see Drawing F12 and F13 for locations): W30C and W31C along the southern perimeter of the BCP building; W32C and W34C near the eastern side of the BCP; and W33C in the storage yard area. The purpose of downgradient deep water quality boring (W33C) is to identify impacts to groundwater from a potential source area identified by soil gas results in the SYA. In addition, one or two deep groundwater quality borings (W35C and W36C) will be performed inside or around the BCP building depending on results of the soil and groundwater sample results obtained from the shallow soil boring activities. W35C will not be conducted if the soil borings in this area do not indicate this as a point of release. W32C and W34C will be drilled contingent on results of the investigation within the BCP. If no source area is identified in the eastern portion of the BCP these borings will not be done. If done, their location will be based upon results of the soil gas and soil boring portions of the investigation. Note that the deep groundwater quality boring(s) that may be performed within the BCP building at source areas identified through soil gas survey results and shallow soil boring sample results (soil and groundwater), will be located based on these results, local groundwater flow information, and accessibility limitations for the larger drilling rig. Deep groundwater quality borings will not be situated directly within areas in which soil gas or soil boring data strongly suggest the presence of DNAPL. If during drilling activities drill water PID (>1,000 instrument units), visual or olfactory evidence or very high groundwater screening results (i.e., near saturation) suggests the potential for existence of a NAPL, the boring will be discontinued and abandoned. This will be done so as not to create a vertical migration pathway for contaminants encountered during drilling. Following abandonment, the water quality boring will be moved to a nearby location that associated investigation data suggests is practicable, blind drilled to approximately 10 ft above the point of encountering possible NAPL in the previous borehole, and continued in a manner as required by the drilling program. The rationale for each deep groundwater quality boring location are summarized in Table 1.

The deep groundwater quality borings will be used to assess potential migration pathways close to the BCP or to identify the presence of unknown sources by detecting contaminants downgradient of the source. These locations are located within and down the average groundwater gradient from the BCP. An average water table contour map is included (Drawing F15) to show average downgradient

directions. A round of water levels will be taken approximately one week prior to drilling activities and a water table contour map prepared to help locate deep groundwater quality borings.

The deep groundwater quality borings will be drilled using the dual tube reverse circulation air rotary drilling method. The method is described in the FSP addendum. Groundwater quality screening will be performed at 10-ft intervals to the top of the clay. When the top of the clay layer is reached a sample will be collected by pulling the drill rod back, if necessary, to collect the sample as close as possible to the top of the clay layer. In addition to the 10 ft routine sampling interval, groundwater samples will be collected at the upper interface of any significant (greater than 1 ft) clay layers encountered above the approximate depth of the continuous clay layer (70 ft). Groundwater quality samples will be analyzed for VOCs using the on-site field GC. A monitoring well will be installed in each deep groundwater quality boring, in the zone of highest contamination, only if the VOC GC screening results for that particular boring indicate the presence of VOCs above MCLs in the groundwater. If more than one distinct zone of contamination exceeding the MCLs is detected, an additional well may be installed in that zone of contamination. Prior to well installation, or boring abandonment, a Shelby Tube sample of the clay layer will be attempted at each groundwater quality boring location.

Monitoring well construction and development is described in the approved Phase 1 planning documents.

2.1.5 Monitoring Well Abandonment/Replacement

Monitoring wells W4 and W12 will be abandoned and replaced with wells W26 and W12R, respectively, because they have been either dry or found to contain only 6 in. of water during most sampling and water level collection events. These wells will be constructed with 10 ft screens. Monitoring well W1 will be abandoned and replaced. The well will be sampled as part of the Phase 2 sampling round to add to the data collected as part of the Phase 1 investigation.

An additional water level monitoring well (W37) will be installed in the Blackhawk Acres Subdivision. This well will be sampled for VOCs as part of the Phase 2 sampling round. The purpose of this well is to provide additional water level information to help determine the water table configuration between the BCP and the affected residential wells. The proposed location is shown on Drawing F12.

Abandonment, construction, and development procedures for the new and replacement wells will be in accordance with the approved Phase 1 Work Plan and Field Sampling Plan.

2.1.6 FSDA Well

One water table well (W38) will be installed downgradient from the FSDA at the location shown on Drawing F12. This well will be sampled for VOCs, SVOCs, and Pesticide/PCB to determine whether contaminants identified within the FSDA have moved downgradient.

2.1.7 Assessment of the BCP Production Well Influence

An assessment of the potential effect of BCP's production wells on local shallow groundwater flow will be dependent on the information derived from the Phase 2 Source Characterization data. Pumping duration and flow rate at production well 441G, which is the shallower of the two currently active production wells at the site, will be recorded over a period of two weeks. Concurrently, water levels will be recorded on an hourly basis at monitoring wells W28, W9, W10, W23, W23B, and well nests W32C, W34C, W35C, and W36C, if installed.

Monitoring of pumping rate and duration will be monitored utilizing existing well instrumentation. Water levels in the groundwater monitoring wells will be measured utilizing a data logger recording device.

2.1.8 Investigative Derived Wastes

Investigative wastes (soil cuttings/purgewater) will be stored on-site in dated, labeled 55 gallon drums pending analytical results. Only wastes from a single boring/well will be in any single drum (i.e., wastes will not be mixed). A running tally of the number of drums used for each location, and total drums of waste will be documented and reconciled.

2.3 LOCATION AND ELEVATION SURVEY

2.3.1 Location Survey

A location survey of all new monitoring wells and soil borings will be performed to provide horizontal ground control. Existing staff gauges will be horizontally resurveyed after being reset. Horizontal locations will be surveyed to the nearest 0.1 ft and tied to the Illinois State Plane Coordinate Grid System.

2.3.2 Elevation Survey

An elevation survey of all new monitoring wells and soil borings will be performed during the horizontal survey. Elevations of ground surface will be to the nearest 0.1 ft, top of protective casing and top of well casing will be to the nearest 0.01 ft. Staff gauges will be surveyed to the nearest 0.01 ft after being reset. Elevations will be relative to the National Geodetic Vertical Datum of 1929.

2.4 CONTAMINANT CHARACTERIZATION

2.4.1 Groundwater Quality Characterization

The Round 2 groundwater sampling and analysis will be conducted at the existing (excluding PVC wells) and new wells listed in Table 2 of this Work Plan Addendum. The parameters to be analyzed and the rationale for this selection are also listed in Table 2.

The Phase 1 Field Sampling Plan presents detailed information regarding groundwater monitoring well sampling procedures and equipment. The groundwater samples will be analyzed for the parameters listed in Table 2. Target compounds and QA objectives for the analyses are described in the approved QAPP.

2.4.2 Background Surface Soil Sampling

Five off-site background surface soil locations (SS12 through SS16) are identified in Drawing F12. Exact locations will be selected in the field with IEPA or their representative. Surface soil samples will be collected for the purpose of providing background conditions for the Baseline Risk Assessment. The background surface soil samples will be collected in accordance with the protocol described in the approved Phase 1 planning documents and Section 3 of this addendum. Surface soil samples will be analyzed for TCL metals as listed in Table 2.

2.4.3 Water Supply Well Sampling

Arrangements will be made for private well sampling and VOC analysis. It is anticipated this will be conducted by the Illinois State Department of Health or the IEPA's designate. This activity will occur outside of this Work Plan.

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ADDENDUM TO THE FIELD SAMPLING PLAN

The IEPA approved the Field Sampling Plan (FSP) for the Beloit Corporation Blackhawk Facility RI/FS (Volume III, Appendix A) prior to the Phase I investigation. That approved document contains detailed procedures for the following sampling activities which will be conducted during the Phase 2 Investigation:

- Soil gas sampling
- Soil boring and subsurface soil sampling
- Deep groundwater quality boring and groundwater sampling
- Monitoring well installation and replacement
- Water level measurement
- Groundwater sampling and chemical analysis

The purpose of this FSP addendum is to describe procedures which will be utilized for the collection of soil gas samples using the hydraulic probe method, and for the collection of surface soil samples not associated with soil boring locations.

3.1 SOIL GAS SAMPLING (HYDRAULIC PROBE)

Soil gas sample collection using the hydraulic probe method (e.g., using a GeoprobeTM) will be identical to the method described in Section 5.1 of the IEPA approved FSP with the following additions. The soil gas sampling pilot hole will be driven to a depth of 3 to 4 ft outside the BCP building, and 6 ft within the BCP building using a hydraulically powered percussion/probing machine (e.g., a GeoprobeTM). The soil gas sample is drawn through a hollow stem probe equipped with a retractable stainless steel point.

3.2 SURFACE SOIL SAMPLING

Sixteen surface soil samples are to be collected during the Phase 2 investigation. Most surface soil sampling locations are not associated with soil borings, therefore, the actual sample collection procedure differs slightly from Phase 1.

Surface soil samples will be collected using stainless steel spoons, trowels, hand corers or bucket augers, depending on which procedure is most appropriate.

- Prior to collecting surface soil samples decontaminate the sampling equipment according to the procedures described in Section six of the Phase 1 FSP.
- Clear surface debris from the sample location using a clean trowel or shovel.
- Collect the surface soil sample at a depth of 0-6 in and place into clean stainless steel bowl.
- Immediately place samples to be analyzed for VOCs into appropriate sample containers (refer to QAPP Table 1-2).
- Fill remaining sample jars according to QAPP Table 1-2, avoid large stones, twigs, etc. that do not represent an integral part of the sample.

Follow sample handling, analysis, and documentation procedures described in Sections 7 and 8 of the Phase 1 FSP.

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ADDENDUM TO THE QUALITY ASSURANCE PROJECT PLAN

The QAPP for the Beloit Corporation Rockton Facility, approved by the U.S. EPA in June 1992, will be updated at a later date to incorporate a change in the proposed analytical laboratories.

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TABLE 1

**Soil Gas, Soil Boring, Deep Groundwater Quality Boring, Surface Soil, and
Monitoring Well Location and Rational Summary
Beloit Corporation - Rockton Facility RI/FS
Phase 2
Rockton, Illinois**

Soil Gas/ Well/Boring Number	Approximate Depth	Approximate ⁽¹⁾ Location	Rational for Placement
Soil Gas SG300 through SG305	6-8 ft	Inside the BCP along south side of former exterior wall and drum loading/unloading area.	Area where potential leakage or spills may have occurred.
SG306	6-8 ft	Inside the BCP at southwest corner of former exterior wall doorway to outside.	Area where potential leakage or spills may have occurred.
SG307	6-8 ft	Inside BCP at former exit.	Area where potential leakage or spills may have occurred.
SG308	6-8 ft	Inside the BCP at end of former exterior wall-doorway to outside.	Area where potential leakage or spills may have occurred.
SG309 through SG311	6-8 ft	Inside the erection building along east wall that separates erection building and the BCP.	Area where potential leakage or spills may have occurred.
SG312	3-4 ft	Outside bay door, south of former exit (currently a lunch room).	Evaluate for potential source area upgradient of well nest W23.
SG313	3-4 ft	Outside east entrance into erection building.	Evaluate for potential source area upgradient of well nest W23.
SG314	3-4 ft	South of former exit (lunch room).	Evaluate for potential source area upgradient of well nest W23.
SG315	3-4 ft	East of former exit (lunch room).	Evaluate for potential source area upgradient of well nest W23.

TABLE 1 (continued)

Soil Gas/ Well/Boring I.D.	Approximate Depth	Approximate ⁽¹⁾ Location	Rationale
SG316 through SG319	3-4 ft	In the vicinity of the shed in storage yard and an exit from the building.	Evaluate for potential source area based on soil boring analytical results for SB21.
SG320 through SG322	3-4 ft	In the vicinity of the paint room area.	Evaluate for potential source area.
SG323 through SG328	6-8 ft	Center of BCP building in plant expansion area and former storage yard.	Evaluate for potential source area.
SG329 through SG333	6-8 ft or 3-4 ft	In and adjacent (west) to BCP erection bay area.	Evaluate for potential source area.
SG334	6-8 ft	Former dry well.	Evaluate for potential source area.
SG335 through SG340	3-4 ft	In parking lot between SYA and BCP building.	Evaluate for potential source area in area of Phase 1 soil gas detects. Note: SG336 located adjacent to Phase 1 SG32 as calibration point.
SG341 through SG347	3-4 ft	In and adjacent to SYA.	Evaluate for potential source area in area of Phase 1 soil gas detects. Note: SG345 located adjacent to Phase 1 SG130 as calibration point.
SG348 through SG353	6-8 ft	Spaced at approximately 150 ft distances within the weldery of the BCP.	Evaluate for potential source area.

TABLE 1 (continued)

Soil Gas/ Well/Boring I.D.	Approximate Depth	Approximate ⁽¹⁾ Location	Rationale
Soil Borings			
SB22 ⁽²⁾	25 ft ⁽⁶⁾	Inside the BCP near former exit and former dry well along old exterior wall.	Evaluate for potential source area.
SB23 ⁽²⁾	25 ft ⁽⁶⁾	Inside the BCP adjacent to former external delivery door.	Evaluate for potential source area.
SB24 ⁽²⁾	25 ft ⁽⁶⁾	Inside the BCP approximately 40 ft east of SB23.	Evaluate for potential source area.
SB25 ⁽³⁾	25 ft ⁽⁶⁾	Adjacent to former exit (currently a lunch room).	Evaluate for potential source area.
SB26 ⁽³⁾	33 ft ⁽⁶⁾	Storage yard at Phase 1 soil gas location SG107.	Source evaluation at Phase 1 soil gas location with detection.
SB27 ⁽³⁾	33 ft ⁽⁶⁾	Storage yard midway between Phase 1 soil gas locations SG131 and SG130.	Source evaluation at soil gas location with detection.
SB28	30 ft	FSDA	To support Feasibility Study.
SB29	30 ft	FSDA	To support Feasibility Study.
SB30 ⁽²⁾	25 ft	Inside BCP erection bay.	Evaluate for potential source area upgradient of monitoring well W23.
GB02	(4)	North of BCP	To provide additional geological information.

TABLE 1 (continued)

Soil Gas/ Well/Boring I.D.	Approximate Depth	Approximate ⁽¹⁾ Location	Rationale
Deep Borings			
W30C	(5)	South side of former exit (currently a lunch room).	Evaluate for potential source area.
W31C	(5)	Outside southern perimeter of BCP near storage shed southwest of Phase 1 soil boring locations SB20 and SB21.	Migration pathway characterization, source characterization.
W32C	(5)	Along eastern side of BCP.	Migration pathway characterization.
W33C	(5)	Storage yard area, near soil boring SB27.	Migration pathway and source characterization based on soil gas detections.
W34C	(5)	Along eastern side of BCP.	Migration pathway characterization.
W35C	(5)	Inside the BCP south of former loading/unloading area. Exact location will be determined after review of soil and groundwater GC screening results.	Migration pathway characterization, source characterization.
W36C	(5)	Inside the BCP near former dry well. Exact location will be determined after review of soil and groundwater GC screening results.	Migration pathway characterization, source characterization.

TABLE 1 (continued)

Soil Gas/ Well/Boring I.D.	Approximate Depth	Approximate ⁽¹⁾ Location	Rationale
Monitoring Wells			
W1R	35 ft	North of Research-Development Building	Replace water table well W01
W26 (W4)	35 ft	Nested with well W26C.	Replace water table well W04.
W37	40 ft	North-east corner of Watts Ave. and Kile Dr. intersection.	Water table control point.
W12R	35 ft	Location of well W12.	Replacement.
W38	35 ft	Near the FSDA.	Downgradient of the FSDA.
W39	35 ft	Inside BCP (location to be determined).	Water table control point.
W40	35 ft	Inside BCP (location to be determined).	Water table control point.
Surface Soil Sample Locations			
SS01, SB26 and SB27	0-6 in.	In SYA.	Evaluate surface soil in SYA for risk assessment purposes.
SS02 through SS06	0-6 in.	In FSSA.	Evaluate surface soil in FSSA for risk assessment purposes.
SS07 through SS11	0-6 in.	In FSDA.	Evaluate surface soil in FSDA for risk assessment purposes.
SS12 through SS16	0-6 in.	Five background locations, outside the designated NPL site as shown on Drawing F12.	Evaluate surface soil in background areas for risk assessment purposes.

- (1) See Drawings F12, F13 and F14 for proposed boring and well locations.
- (2) Grab groundwater sample at water table for GC analysis. Up to 3 additional soil borings will be conducted if a source area is positively identified.
- (3) Grab groundwater sample at water table for GC analysis only.
- (4) The geotechnical boring will be drilled to the top of the clay layer and one shelly tube sample will be attempted to be collected from the clay.
- (5) Determined by the presence of potential NAPL contamination, or to the continuous clay layer at an approximate depth of 70 feet.
- (6) Borings will be extended to the water table.

TABLE 1 (continued)

NOTES:

BCP = Beloit Corporation Plant

SYA = Storage Yard Area

FSSA = Fiber Sludge Spreading Area

FSDA = Foundry Sand Disposal Area

SG = Soil Gas

SB = Soil Boring

GB = Geotechnical Boring

W = Well

SS = Surface Soil

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[J:/1526892/Table-1]

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TABLE 2

**Summary of Analytical Parameters (1)
Phase 2 Work Plan Addendum
Beloit Corporation-Blackhawk Facility
Remedial Investigation/Feasibility Study**

Well ID	GC Field Screening Volatiles (water)	GC Field Screening Volatiles (soil)	TCL Volatiles	TCL Semi- volatiles	TCL Pesticides/ PCB	TAL Metals	Groundwater Indicator Parameters	Soil Physical Parameters
Existing Groundwater Monitoring Wells (2)								
W03R			X			X		
W05R			X					
W06			X	X	X	X	X	
W08R (Bkgd)			X	X	X	X	X	
W11R (Bkgd)			X	X	X	X	X	
W13			X					
W14			X		X	X		
W15			X			X	X	
W16R			X					
W17			X					
W18			X					
W19			X					
W19B			X					
W20			X					
W20B			X		X	X		
W21			X					
W21B			X	X	X			
W22			X					
W22B			X		X			
W22C			X		X			
W23			X					
W23B			X	X				
W24 (bkgd)			X	X	X	X	X	
W25C			X					
W26C			X	X	X			
G103D			X					
G103S			X					
G104			X					
G107 (Bkgd)			X	X	X	X	X	
G108D			X					
G108S			X					
G109			X					
G110			X		X			

See Page 3 of Table 2 for Sampling and Analysis Rationale.

Table 2 (continued)

Well ID	GC Field Screening Volatiles (water)	GC Field Screening Volatiles (soil)	TCL Volatiles	TCL Semi-volatiles	TCL Pesticides/PCB	TAL Metals	Groundwater Indicator Parameters	Soil Physical Parameters
Proposed Groundwater Monitoring Wells (3)								
W1R			X	X	X	X	X	
W12R			X	X	X	X	X	
W26			X	X	X	X	X	
W37			X					
W38			X	X	X			
New Wells *		X	X	X	X	X	X	
* The number and location of new wells will be based on soil gas, soil, and groundwater quality screening.								
Proposed Soil Borings (4)								
<i>BCP</i>								
SB22 (5)	X	X	X	X	X	X		X
SB23 (5)	X	X	X	X	X	X		X
SB24 (5)	X	X	X	X	X	X		X
SB30 (5)	X	X	X	X	X	X		X
SB25	X	X	X	X	X	X		X
<i>SYA</i>								
SB26	X	X	X	X	X	X		X
SB27	X	X	X	X	X	X		X
<i>FSDA</i>								
SB28	X		X	X	X	X		X
SB29	X		X	X	X	X		X
Proposed Groundwater Quality Borings								
<i>BCP</i>								
W30C	X							
W31C	X							
W32C	X							
W34C	X							
W35C	X							
W36C	X							
<i>SYA</i>								
W33C	X							
Geotechnical Borings								
GB2								X
Proposed SYA Surface Soil Sample (6)								
326-00			X	X	X	X		X
SB27-00			X	X	X	X		X
SS01			X	X	X	X		X
Proposed FSDA Surface Soil Samples (6)								
SS02			X	X	X	X		X
SS03			X	X	X	X		X
SS04			X	X	X	X		X
SS05			X	X	X	X		X
SS06			X	X	X	X		X

Table 2 (continued)

Well ID	GC Field Screening Volatiles (water)	GC Field Screening Volatiles (soil)	TCL Volatiles	TCL Semi-volatiles	TCL Pesticides/PCB	TAL Metals	Groundwater Indicator Parameters	Soil Physical Parameters
Proposed FSSA Surface Soil Samples (6)								
SS07			X	X	X	X		X
SS08			X	X	X	X		X
SS09			X	X	X	X		X
SS10			X	X	X	X		X
SS11			X	X	X	X		X
Proposed Background Surface Soil Samples (7)								
SS12						X		X
SS13						X		X
SS14						X		X
SS15						X		X
SS16						X		X

(1) This table presents a summary of analytical parameters for Phase 2 of the Beloit Corporation Blackhawk Facility RI/FS. An "X" indicates the well is to be sampled for the indicated group of analytical parameters. A blank space indicates the analysis will not be performed during Phase 2. The following discussion details the rationale for parameter selection.

(2) All wells except PVC wells (W2, W7, W9, W10, and W12) will be analyzed for VOCs during Phase 2. If a TCL compound for semivolatile, or pesticide/PCB analytical parameter group was detected in a well sample during the Phase 1 investigation, the well is to be sampled and analyzed for that analytical parameter group during Phase 2. If any TAL parameter was detected above the MCL in a well sample during the Phase 1 investigation, the well is to be sampled and analyzed for TAL parameters during Phase 2. Samples from background wells W08R, W11R, W24, and G107 will be analyzed for the full TCL and TAL parameter groups.

Indicator parameters include alkalinity, chloride, sulfate, Nitrate+Nitrite-Nitrogen, Ammonia-Nitrogen, phenolics, and total dissolved solids. Indicator parameters will be analyzed for in the Phase 2 sample from W15 and W6 to determine if changes have occurred since Phase 1, and in background wells W08R, W11R, W24, and G107.

(3) Proposed Monitoring wells include both predetermined wells and selected deep groundwater quality boring locations based on field screening results. The TCL/TAL and indicator parameter groups will be analyzed for in Phase 2 samples collected from the newly developed monitoring wells, as presented in the Proposed Groundwater Monitoring Well section of this table. Proposed monitoring well W37, located in the Blackhawk Acres Subdivision, is a groundwater control point, and will be sampled for VOCs only.

(4) Soil borings are to be screened for volatiles by field GC during drilling, as described in the Work Plan Addendum. Selected samples (up to 2 each) from each boring will be analyzed for CLP TCL/TAL parameters. In addition, a minimum of nine grain size analyses and five TOC analyses will be conducted.

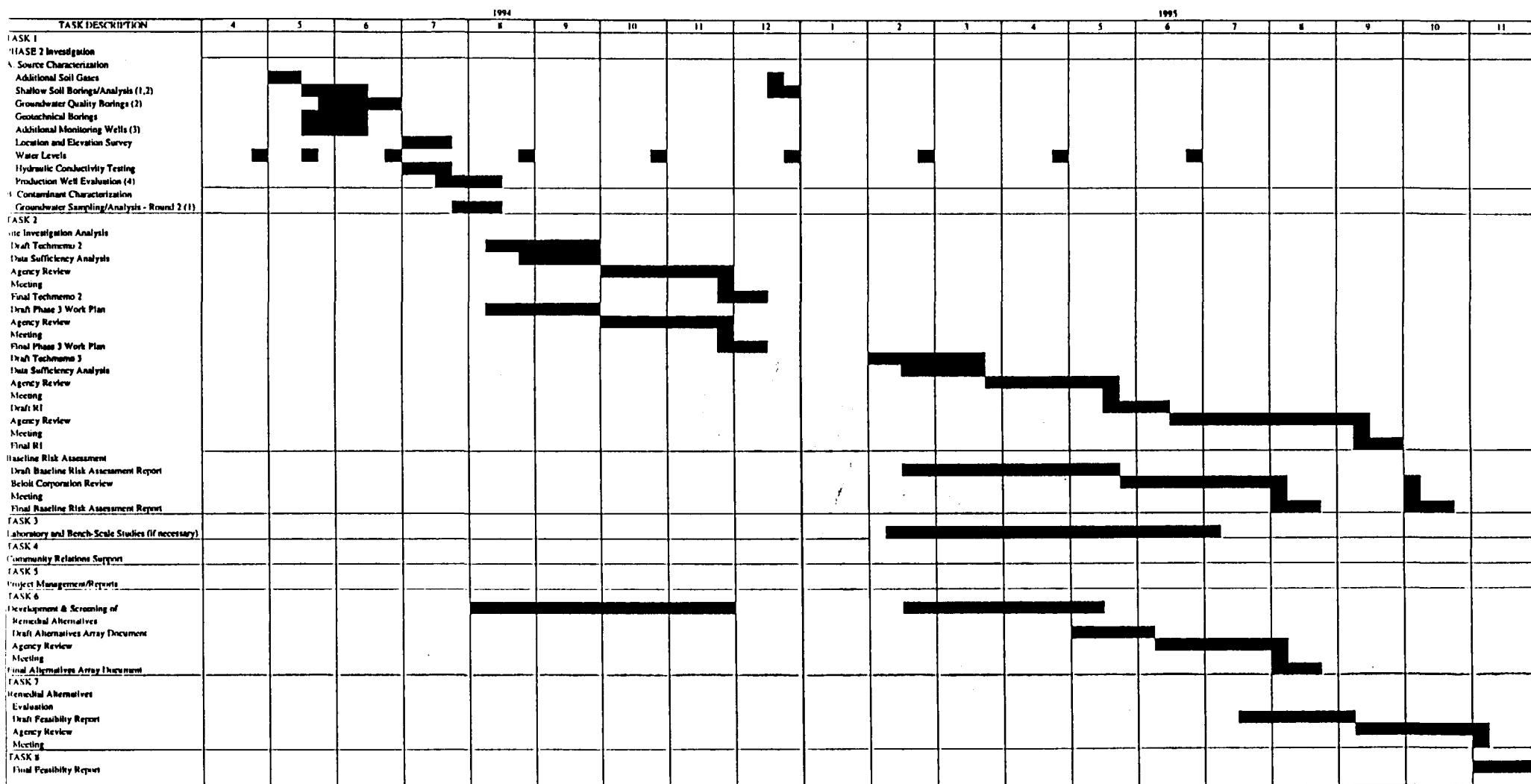
(5) BCP Soil Borings - Three additional soil borings will be performed in the vicinity of each of the four initial borings if a source area is positively identified. Analysis of the soils from each of the three additional borings will follow the same rationale as the four initial borings.

(6) Surface soil samples will also be collected at 5 locations in the FSSA, 5 locations in the FSDA and three locations in the SYA (two at locations of soil borings). These samples will be analyzed for CLP TCL/TAL parameters.

(7) Surface soil samples for evaluation of background metals concentrations will be collected at 5 mutually agreeable locations.

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[J/1525892/Table 2]

FIGURE 1
Remedial Investigation Project Schedule
Beloit Corporation Blackhawk Facility
Remedial Investigation/Feasibility Study



Notes:

(1) Analytical turnaround time is estimated to be 35 working days. (3) Includes wells to be abandoned/replaced and well W37 in Blackhawk Acres Subdivision.

(2) Field GC Screening

(4) If required